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Regulatory Development Plan, Location Standards for RCRA (Resource Conservation and Recovery Act) Hazardous Waste Facilities Regulatory Development Plan

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Guidance Criteria

16. Abstract (Limit: 200 words)

This document identifies [illegible]edures to implement Section 3004(o) of the Hazardous and Solid [illegible]te Amendments (HSWA) of 1984 which requires that design and operating regulations be developed which specify criteria for acceptable location of new and existing treatment, storage, and disposal facilities as necessary to protect public health and the Environment.

The Agency is required to publish specific guidance criteria identifying areas of vulnerable hydrogeology by May 1986.

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LOCATION STANDARDS
FOR RCRA HAZARDOUS WASTE FACILITIES

REGULATORY DEVELOPMENT PLAN

U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF SOLID WASTE

WASHINGTON, D.C.

DECEMBER 1985

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REGULATORY DEVELOPMENT PLAN

I. PURPOSE

Section 3004(o) of the Hazardous and Solid Waste Amendments (HSWA) of 1984 requires that design and operating regulations be developed which "... specify criteria for the acceptable location of new and existing treatment, storage, and disposal facilities as necessary to protect public health and the environment." To fully assess the acceptability of a location for a hazardous waste facility, the Agency is also required to publish specific "... guidance criteria identifying areas of vulnerable hydrogeology" by May 1986."

In the past, a lack of Federal and State legislation, a relative surplus of available land and water resources, and the nature of the free market economy allowed generators of hazardous waste to treat, store, or dispose of waste in the least costly manner. These methods included management of waste not only in poorly designed and poorly operated units, but in locations where hydrogeologic conditions and the proximity of facilities to other activities encouraged rapid migration of waste and contamination of ground-water resources and endangerment of the public health.

Background:

The physical location of a hazardous waste management facility directly influences the potential for impacting public health and the environment. Physical location refers to the geologic, hydrologic, and pedologic characteristics of a site, as well as adjoining lands, surface water, ground water and air that may be

impacted in the event hazardous constituents are released from the facility. A 1983 EPA study concluded that proper site selection and appropriate hydrologic and geologic conditions are important factors in maintaining long-term protection of the environment.

On December 18, 1978, EPA proposed standards to control the location of facilities in seismic zones, 100-year floodplains, coastal high hazard areas, 500-year floodplains, wetlands, critical habitats of endangered and threatened species, and recharge zones of sole source aquifers, as well as specific standards to delimit the location of active portions of facilities with respect to the facility's property line. Public comments and additional research regarding the proposed standards were evaluated and on January 12, 1981, EPA promulgated two of the eight candidate standards. The 100-year floodplain and seismic zone restrictions are found under 40 CFR Part 264.18, as authorized by the Resource Conservation and Recovery Act (RCRA) of 1976. The other six standards were not promulgated because they either required more research, were at least partially addressed in regulations promulgated under laws other than RCRA, or were rejected as unnecessary to protect human health and the environment.

Based upon a recent review of selected RCRA permit applications, the Agency has found that many hazardous waste management facilities are located in terrains that may cause adverse impacts of public health and the environment in the event of failure in the design and operation of a unit and that the safe and proper location of such facilities has not been a priority in the past.

Currently, there is little incentive at the State or Federal levels to properly and safely locate hazardous waste treatment, storage, and disposal facilities. Rather than selecting locations that are safest and most hydrogeologically stable, and where ground-water and surface-water resources are least vulnerable to contamination, locations appear to be selected based on low land cost and close proximity to waste generators. To alleviate the threat to public health and the environment and to reduce the massive costs for cleanup incurred by the Federal Government under CERCLA, standards for the safe and proper location of new and existing hazardous waste management facilities are needed to compliment the current RCRA program that ensures safe and proper design and operation of these facilities.

In January 1984, the Agency examined criteria used by the States for controlling the location of hazardous waste management facilities. The majority of States have not established a program for facility location. Some States determine site acceptability on the basis of one or more hydrogeologic parameters such as minimum acceptable depth to the water table beneath a facility or maximum acceptable soil permeability. A significant result of this analysis is that a definition of an acceptable location or vulnerable hydrogeology based upon a single property of a location would be extremely difficult to apply in many States. In addition, single properties of a location, such as depth to ground water, cannot be easily isolated from other factors needed to describe the performance characteristics of a hydrogeologic terrain. Based upon this review, the Agency has further concluded that the

States have been inconsistent in their approaches for ensuring safe and proper location of facilities.

Approach:

The Agency is addressing the problems of hazardous waste facility location in a two step process. The first step establishes a series of guidance manuals for use by RCRA permit writers and permit applicants for the preparation of permits for hazardous waste surface impoundments, waste piles, and landfills regulated under RCRA. The second step will establish comprehensive standards to ensure that facilities are located in areas that ensure protection of the public health and the environment. With this Regulatory Development Plan, the Agency is initiating development of these standards.

The Phase I and Phase II guidance manuals are structured to address only the hydrologic and geologic factors inherent in locating RCRA facilities to ensure that the potential for exposure of human health and the environment in the event of a facility failure is minimized. The guidance manuals provide the preliminary foundation for development of the hydrogeologic elements of the regulatory program to control siting of new and existing hazardous waste management facilities. The Phase I Location Guidance (February 1985; Draft Final) developed prior to enactment of the Amendments describes five criteria for an acceptable location and cites existing applicable regulations under RCRA and other Federal laws for controlling the location of unacceptably located facilities. The vulnerable hydrogeology criterion briefly discussed in the Phase I manual has been further developed in a

Phase II manual that partially fulfills the requirements of the recent RCRA Amendments (i.e., issuance of guidance criteria). This Phase II Location Guidance Manual presents criteria for identifying areas of vulnerable hydrogeology.

EPA's Office of Solid Waste (OSW) has designed the Phase II guidance to provide a simple technical method for measuring potential contaminant migration along a ground-water flow line beneath a facility. The time-of-travel (TOT) or rate at which contaminants in ground water can migrate, is the basis for defining the vulnerability of ground water beneath the facility. Ground-water TOT provides a simple means of comparing the vulnerability of ground water to contamination in various hydrogeologic settings. In the case of hazardous waste facilities, a simple means of defining vulnerability is especially necessary because so little is known about facility failure and the complex chemistry of hazardous waste leachate. TOT is an appropriate measure of vulnerability for several reasons: it supports the overall objective of "minimizing the potential for exposure" by encouraging siting within aquitards that contain ground water that is not considered to be a resource for drinking water or other uses; it is closely linked to two other important location criteria: site characterization and the ability to conduct proper ground-water monitoring at a location; it is designed to encourage siting in locations having minimal ground-water flux and velocities. TOT may also be calculated with relative ease, and requires no complicated analysis that sometimes involve many weakening assumptions.

The vulnerability of ground water also depends upon a usage class assigned to the ground-water resource. The criterion that defines hydrogeologic conditions that make ground water vulnerable to contamination is closely keyed to the Agency's Ground-Water Protection Strategy. The Strategy classifies ground water into three groups based upon the value of the ground water as an environmental resource, and further categorizes these groups on the basis of the vulnerability of the hydrogeologic setting to ground-water contamination.

II. ISSUES

A comprehensive evaluation of alternative controls on hazardous waste facility location must be based on understanding and resolving important policy, legal, economic, social, political, and technical issues. The primary issues are global in nature. Continued analysis will focus on narrower questions once these larger concerns are understood. The global issues that will be investigated first in analyzing alternatives for facility location standards include:

- Adequacies and inadequacies of existing location standards promulgated under RCRA.
- Trade-offs associated with the selected balance between added location standards and guidance criteria and the level of flexibility in implementation that each affords.
- Trade-offs between active and passive controls on location. The investigation will address the question of whether certain locations warrant more

or less design and operation (active) controls depending on location characteristics. Location controls will be evaluated as a function of facility design (e.g., monofills) and waste type. The suitability of specifying location controls or bans without regard for unit design and operation will be explored.

° Appropriate strategies for integrating existing State and Federal programs and regulations. For instance, it is necessary to determine a balance in jurisdiction among EPA, the States, and/or local governments in recognition of current rules and strategies. At the federal level, at least the following programs must be considered:

- Existing RCRA location standards and guidance,
- The RCRA waste ban and petition process (It is appropriate to project the types of wastes that new facilities will receive),
- The Ground-Water Protection Strategy, and
- Existing location regulations governing disposal of low and high level radioactive wastes.

° Assessment of the contaminant transport media that are worthy of consideration in developing standards, such as:

- ground water
- surface water
- air
- subsurface gas
- contaminated soils
- releases during waste transporation, and
- releases during waste management.

- Distinctions in control strategies for new versus existing facilities or off-site versus on-site facilities.
- Appropriate conditions (i.e., hydrogeologic, proximal) that warrant bans on siting in certain locations.
- Assessment of how various control strategies will impact existing local or State zoning and jurisdictional restrictions or may require local or State governments to establish new jurisdictional controls to enact Federal location requirements.

III. ALTERNATIVES

In developing regulations for location of hazardous waste facilities, the Agency will consider the following basic alternatives for the proposed rulemaking:

- Standards applicable to owners and operators of treatment, storage, and disposal facilities based upon a combination of hydrogeologic factors only; geologic terrains identified as unacceptable for a facility location, flow net characterization of subsurface ground-water flow conditions and calculation of ground-water TOT; aquifer characteristics, assessment of current and potential exposure to contaminated ground water, and assessment of risk to human health and the environment.

- Standards based upon a combination of hydrogeologic factors, as well as those affecting other media, such as surface water, air, subsurface gas migration, and soil, as these relate to facility location.
- In addition to the above, standards for the physical location of a facility that consider social, economic, and transportation factors and issues, such as location proximity to population centers, zoning restrictions, use of buffer zones between land used for treatment, storage, and disposal facilities and for other uses.
- No additional location standard.

The advantages and disadvantages of each basic alternative and a series of more specific strategies under each of the basic alternatives will be evaluated. The Agency will study the benefits and costs of each alternative using various risk cost models, various tradeoffs in existing RCRA design and operation standards, and the effect of location standards on the waste ban and waste restriction provisions of the HSWA. The "Liner Location Risk and Cost Analysis Model" developed by OSW (January 1985) will be used to analyze various risks and costs that are a result of each regulatory approach analyzed. A compilation of information on cases of damage at RCRA sites, remedial actions of sites being cleaned up under CERCLA, and facilities investigated for RCRA compliance violations will be developed as case studies to support the approach selected for location standards.

After evaluating the basic alternatives, more specific strategies under each alternative will be evaluated. Bans, performance-based standards, or risk-based standards or a combination of these controls based on hydrogeologic conditions at a site, for example, can be used to limit siting in areas where a high potential for contaminant migration to ground water or other media exists. Alternative location strategies that will be evaluated for protecting ground-water resources and users include the following:

- Prohibiting location in high hazard areas, such as flood-prone areas or seismic impact zones (in a more stringent manner than currently regulated), volcanic zones, landslide-susceptible areas, subsidence-prone areas, and unstable soils;
- Prohibiting location in areas that cannot be fully characterized or monitored;
- Prohibiting location in vulnerable settings above current or potential sources of drinking water (i.e., Class I or II ground water) as defined in the Agency's Ground-Water Protection Strategy;
- Limiting location to settings where contamination will migrate very slowly (i.e., in locations with long estimated TOT); and,
- Limiting location to areas that are currently contaminated (i.e., contaminated and isolated ground waters, such as Class III in the Ground-Water Protection Strategy).
- Location with respect to floodplains, high quality surface waters, and wetlands could have more stringent controls.

Alternative strategies may also be considered for other media, including air, subsurface gas, surface water, and soil. Protection against exposure to airborne contaminants, for example, may include controls for minimum property size or minimum distances from property lines or residences. These controls may consider such site characteristics as local meteorologic and terrain conditions. Location controls to prevent surface water contamination may include criteria for distances from surface waters and potential for run-off.

Strategies that consider social impact and releases during waste transportation may include zoning restrictions, buffer zones around hazardous waste facilities, prohibiting siting on special-use lands, such as parks and wildlife refuges, or requiring minimum distances from population centers.

Several economic alternatives will be considered. These include locational controls through federal tax incentives, and locational incentives through a program of federally-underwritten liability insurance. Each strategy will be evaluated and further refined by consideration of effectiveness in achieving protection of human health and the environment, technical feasibility, implementation feasibility, including institutional, political, and Agency staff considerations, costs to the Agency and the regulated community, and Interagency consistency.

Further development of the strategies will reflect the analysis of technical and policy issues. The alternative strategies selected will distinguish between new and existing facilities, and they may distinguish between waste types and/or current RCRA facility designs.

IV. CLASSIFICATION AND ANALYSIS

Preliminary analyses of potential rules indicate that costs and effects would be below the thresholds specified for major rules, although one-time costs may be substantial. For this reason, standards developed to control facility location will be classified as a significant action. As such, a Regulatory Impact Analysis (RIA) is required by the Office of Management and Budget (OMB). The RIA will document all of the impact analyses performed during regulatory development.

The advantages and disadvantages of each of the regulatory alternatives will be evaluated. Among the analytical tools that are available for this task are: the "Liner Location Risk and Cost Analysis Model" developed by OSW, and a compilation of case studies and site reports of ground-water contamination at RCRA and CERCLA facilities that is part of the Phase II location guidance manual.

The recommended strategies for location control will be selected following examination of factors that include, at a minimum: effectiveness in protecting human health and the environment, regulatory cost, economic impact, regulatory flexibility, ease of implementation, and effect on existing Agency policies

and regulations. To satisfy requirements for a Regulatory Flexibility Analysis, the economic impact analysis will be performed in such a manner that differential impacts upon small business entities can be examined and any disproportional impacts can be identified.

V. SCHEDULE

The following list identifies tasks that will be performed and milestones for each task in developing location standards. The activity is identified in the OSW Workplan Tracking System as 86-08016G and in the Administrator's Tracking System as ATS-003.

##	Milestones	Date (Original)
01	Start Action Request (SAR) for proposed RCRA location standards to AA	09/30/85 09/19/85 (Actual)
02	Draft Regulatory Development Plan (RDP) to OD	01/03/86
03	RDP to AA/OSWER	01/15/86
04	Organize Work Group and distribute RDP	01/31/86
05	RDP to Steering Committee	01/31/86
06	RDP approved by OPPE	03/14/86
07	Draft Options Package on proposed rules to OD	05/30/86
08	Draft Options Package to AA/OSWER	06/13/86
09	Options Package to Work Group	06/27/86
10	Complete options selections - Work Group Closure	09/26/86
11	Notice of Proposed Rulemaking (NPRM) to OD	11/21/86
12	NPRM to AA/OSWER	01/09/87
13	Draft regulatory package and NPRM to Steering Committee	02/10/87

14	NPRM approved by OPPE	05/15/87
15	NPRM to Red Border and OMB	05/30/87
16	NPRM to Administrator	08/30/87
17	Publish notice of proposed rulemaking in FR	09/30/87

VI. INTERNAL AND EXTERNAL PARTICIPATION

Glen Galen of OSW's Land Disposal Branch is Work-Group Chairman. The Work Group will include participants from the following Agency program offices:

Headquarters:
- Office of General Council (OGC)
- Office of Ground-Water Protection (OGWP)
- Office of Pesticides and Toxic Substances (OPTS)
- Office of Solid Waste (OSW)
  - Land Disposal Branch
  - Economic Analysis Branch
- Office of Waste Programs Enforcement (OWPE)
  - CERCLA Enforcement Division
- Office of Emergency and Remedial Response (OERR)
  - Remedial Action and Contracts Branch
- Office of Enforcement and Compliance Monitoring (OECM)
- Office of Policy Analysis (OPA)
  - Hazardous Waste Branch
- Office of Research and Development (ORD)
- Office of Federal Activities (OFA)
- Office of Radiation Programs (ORP)
  - Criteria and Standards Division
- Office of Air Quality Planning and Standards (OAQPS)

Regional Offices: Regions I, III, V, VI, and VII

Other Federal Agencies, States, and private consultants will also participate in the work group. The external groups are:

Federal Agencies:
- U.S. Geological Survey (USGS)
- U.S. Department of Energy (DOE)
- U.S. Nuclear Regulatory Commission (NRC)

States: TBA (Representative States from the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and the Consortium of State Hazardous Waste Siting Authorities)

Other External Groups: Technical Consulting Firms (TBA)

The external groups will provide a perspective from Agencies and States that have developed similar programs for hazardous, nonhazardous, and radioactive wastes. Consultants will be hired under extramural contracts to provide technical support and expertise on various specific issues to be addressed in the regulatory development program. A list of work group members is attached (see Attachment A).

VII. RESOURCES

Fiscal Year 1986 (proposed)

	Personpower	Contractor Support
OSW only	2.6 FTE	$550K

VIII. EXPECTED REACTION OF OUTSIDE GROUPS

The expected public reaction to RCRA facility location standards is briefly discussed below and is organized by outside groups.

Hazardous Waste Industry

Generators:

This group will resist any regulatory alternatives that will increase the cost of operation. Large cost increases will probably elicit a negative reaction from the Chemical Manufacturers Association.

Facility Owners and Operators:

This group will tend to resist any location alternatives or strategies that will diminish their profits. Regulations which have varying impacts on facilities will be met with particularly strong resistance. If

the cost burden is uniform, this industry segment may pass the cost on to generators.

Environmental Lobby

This group is expected to lobby to make location standards as stringent and restrictive as possible. They will also use legal channels to see that promulgation schedules are met.

Local and State Interests

Since siting is always controversial at this level, local groups are expected to react against location of a RCRA facility in their neighborhood. In particular, if the proposed standards result in a limited number of acceptable sites, local and State interests in these potential facility locations will strongly resist those standards.

Office of Management and Budget

OMB will react to limit the direct regulatory cost to EPA and to limit costs to private industry.

Congress

Congress will represent the interests of lobby groups and local constituencies that have the strongest representation in their home State. These groups include industry and environmental lobbies and local and State constituencies.

Attachment A

WORK GROUP FOR DEVELOPMENT OF RCRA LOCATION STANDARDS
(Current as of 1/15/86)

OSW

Glen Galen
Arthur Day
George Dixon
Janette Hansen
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OWPE

Patty Bubar
Jacqueline Moya

OERR

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Leon Kuchinski, Pennsylvania

Consultants

(To be announced; pending
FY 86 Contract approval)